

Kohsaku YAMADA*: **Two new species of *Radula*
(Hepaticae) from Australia and Brazil**

山田耕作*: オーストラリアとブラジル産のケビラゴケ
(苔類) の 2 新種

Recently I had an opportunity to study a small collection of *Radula* made by Mr. Alfrons Schäfer-Verwimp in Brazil and another made by Dr. I. G. Stone and Prof. G. A. M. Scott in Queensland, Australia. Among them I have recognized two species new to science whose descriptions and illustrations are given below.

***Radula squarrosa* Yamada, sp. nov. (Fig. 1)**

Planta mediocris, brunnea; caulis 10-15 mm longus, irregulariter pinnatim ramosus; ramis amentulosis numerosis; folia laxe imbricata, ovata, semper squarrosa, apice obtuso, cellulae medianae 19-20(-23) \times 14-16 μm , trigonis magnis, cuticula laevi; lobuli subrectangulati, oblique patuli, margine hyalino limbato, basi caulem haud tegente. Dioica? (Androecia haud vidi). Gynoecia in caule vel ramis terminalia.

Plants medium-sized, brown in herb., growing on bark of trees. Stem 10-15 mm long, ca 0.1 mm in diam., with leaves 1.8-2.0 mm wide, irregularly, pinnately and densely branched, obliquely spreading, ordinary branches ca 0.07 mm in diam., with leaves 1.4-1.6 mm wide; amentulose branches numerous, 1.2-1.4 mm long, with 5-10 pairs of small, reduced, fusiform leaves; stem 6 cells thick, cortical cells as large as medullary cells, both cells thick-walled with large trigones, pale brown. Leaf-lobes loosely imbricate, widely spreading, \pm concave, when dry and moist usually strongly squarrose, when flat ovate, 0.8-1.0 mm long, 0.7-0.8 mm wide, apices obtuse, not incurved, dorsal bases slightly arched, small, not auriculate at base, covering 2/3 or more of the stem-width (or rarely slightly extending beyond the farther edge of stem), insertions substraight; cells thin-walled with large trigones (intermediate thickenings not seen), marginal cells 10-12 \times 10-11 μm , median cells 19-20(-23) \times 14-16 μm , basal

* [REDACTED] Ise-shi 516, Mie-ken; also the Hattori Botanical Laboratory, Nichinan-shi, Miyazaki-ken 889-25. 伊勢市 [REDACTED]

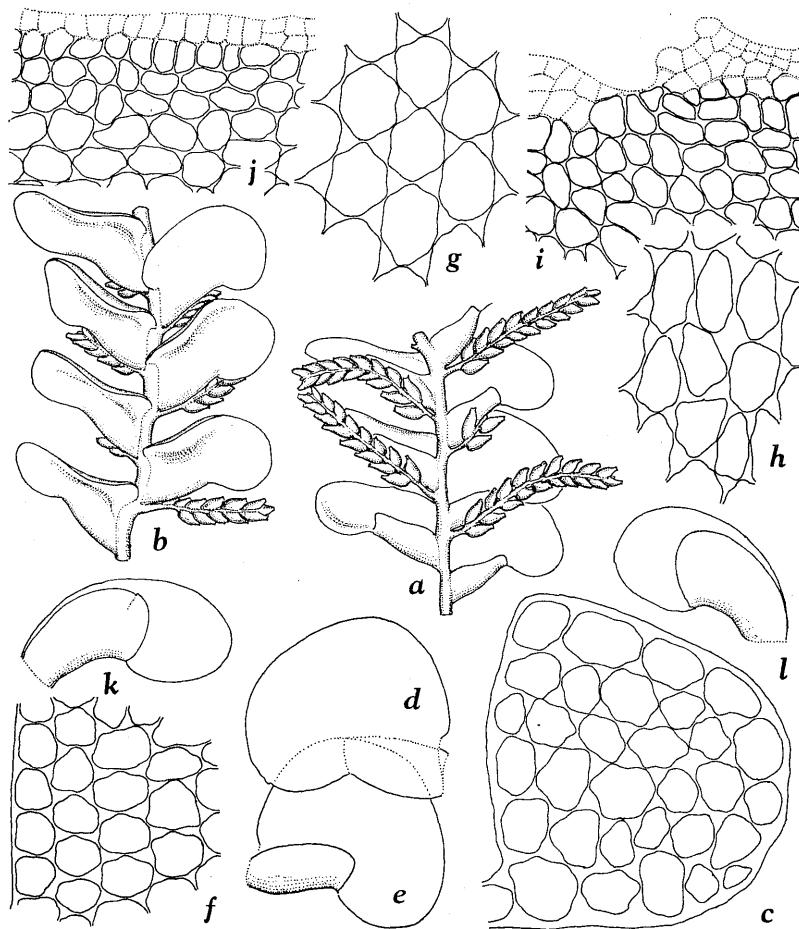


Fig. 1. *Radula squarrosa* Yamada. a, b. Portions of plant, a ventral view, b dorsal view, $\times 16$. c. Portion of cross-section of stem, $\times 480$. d, e. Leaf-lobes, $\times 23$. f-h. Cells of lobe of stem-leaf, f from margin, g from middle, h from base, all $\times 480$. i, j. Marginal portions of leaf-lobules with hyaline cells, $\times 480$. k, l. Female bracts, $\times 23$. Drawn from holotype.

cells $18-20 \times 10-11(-14) \mu\text{m}$; cuticle smooth; leaf-lobules remote, obliquely spreading, subrectangular, ca 1/2 of the lobe-length, 0.46-0.53 mm long, 0.21-0.25 mm wide, apices obtuse, never elongate, abaxial margins substraight, not decurrent, adaxial margins substraight or rarely slightly arched, both abaxial

and adaxial margins with 1-2(-3) layers of hyaline cells, bases not covering the stem, insertions substraight, carinal regions weakly inflated; rhizoid-initial areas \pm convex, small, rhizoids rarely seen, subhyaline; keel spreading at angles of 55-60° with the stem, 0.53-0.6 mm long, slightly arched or substraight, not decurrent, sinuses very wide.

Dioicous? (Androecium not seen). Gynoecium terminal on stem or branch, with two subfloral innovations; bract-lobe falcate oblong-ovate with obtuse apex, bract-lobule oblong-ovate with obtuse apex and slightly sinuate keel; perianth not seen.

Type: Australia. Queensland: Ballenden Ker., Montane rain forest, on bark of trees, 3 Sept. 1986, G. A. M. Scott 131—holotype (MUCV), isotypes (NICH, TNS).

Distr.: Known only from the type collection.

The diagnostic characters of the present species are (1) the plants with loosely imbricate, ovate, and usually squarrose leaf-lobes, (2) the thin-walled cells of leaf-lobes with large trigones and smooth cuticle, (3) the subrectangular leaf-lobules not covering the stem, with substraight or slightly arched, not decurrent keels, and with 1-2(-3) layers of hyaline marginal cells, and (4) the numerous amentulose branches with 5-10 pairs of small, reduced leaves.

The present species is most closely related to *Radula iwatsukii* Yamada which is distributed in Borneo and Guadalcanal Is., but the latter is different from *R. squarrosa* by (1) the reddish-brown plants, (2) the leaf-lobes never squarrose when dry and moist, and (3) the subnodulose, \pm confluent trigones and densely verrucose cuticle of cells of leaf-lobes. The present species belongs to sect. Amentulosae of subgen. *Radula*. The differences of *R. squarrosa* and its related (or similar) species from Queensland are shown in the following key.

1. Amentulose branches with small, hook-shaped leaves *R. thiersiae*
1. Amentulose branches with small, fusiform leaves 2
2. Leaf-lobes usually squarrose; leaf-lobules subrectangular, with flat adaxial margins and with 1-2(-3) layered hyaline marginal cells *R. squarrosa*
2. Leaf-lobes not squarrose; leaf-lobules subquadrate to narrowly ovate, with usually narrowly recurved adaxial margins and without hyaline marginal cells..... *R. hicksiae*

***Radula shaeferverwimpia* Yamada, sp. nov. (Fig. 2)**

Planta sterilis, parva, olivacei-virens; caulis 5-8 mm longus, irregulariter

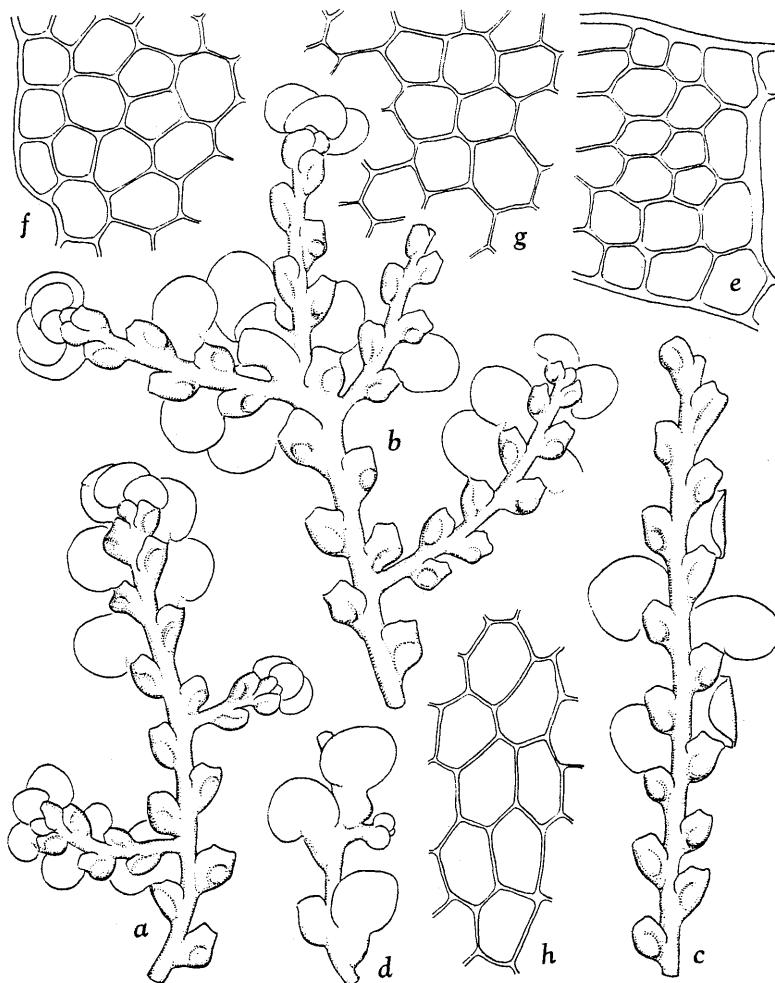


Fig. 2. *Radula shaeferverwimpii* Yamada. a-d. Portions of plant, b with gynoecium, a-c ventral view, d dorsal view, $\times 23$. e. Portion of cross-section of stem, $\times 480$. f-h. Cells of lobe of stem-leaf, f from margin, g from middle, h from base, all $\times 480$. Drawn from holotype.

pinnatus; folia laxe imbricata vel leviter remota, caduca, in plano ovata vel anguste ovata, apice obtuso, paries tenuis, trigonis nullis, cuticula laevi; lobuli remoti in situ ovati (in plano subquadrati), apice angulato (in plano), basi

caulem 1/5 tegente, area caulina valde inflata, carina angulo 30-40° patens, valde arcuata, sinu subacuto.

Plants small, fragile, sterile, olive-green in herb. Stem 5-8 mm long, ca 0.12 mm in diam., with leaves 1.0-1.2 mm wide, irregularly pinnately branched, branches 1.0-1.8 mm long, with leaves 0.7-0.8 mm wide; stem 6 cells thick, cortical cells as large as medullary cells, both cells thin-walled without, or rarely with indistinct trigones, pale yellow. Leaf-lobes loosely imbricate to slightly remote, widely spreading, fragile and frequently caducous, slightly concave, ovate to narrowly ovate, apices obtuse, not incurved, dorsal base not auriculate, but widely arched and covering 3/4-1/2 of the stem-width or rarely extending beyond the farther edge of the stem, insertions substraight; cell-walls uniformly thin, trigones absent, marginal cells (8-)12-16×13-16 μm , median cells 16-18(-21)×12-15 μm , basal cells 21-25×11-16 μm ; cuticle smooth; leaf-lobules remote, obliquely spreading, ovate in situ (when flat subquadrate), ca 1/2 of the lobe-length, 0.46-0.51 mm long, 0.33-0.5 mm wide, apices bluntly angular (when flat), abaxial margins substraight, not decurrent, adaxial margins substraight (rarely slightly arched), bases covering 1/5 of the stem-width, insertions substraight, carinal regions usually widely and strongly inflated; rhizoid-initial areas convex, rhizoids rarely seen, pale brown; keels spreading at angles of 30-40° with the stem, 0.25-0.30 mm long, strongly arched, not decurrent, sinuses subacute.

Type: Brazil. National Park Serra de Caparao, Meta atlantica im vale Verde, auf schattigem Felsblock, 1360 m, 28 July 1987, Alfons Schäfer-Verwimp 8989—holotype (NICH), isotypes (hb. S-Verwimp, TNS).

Distr.: Known only from the type collection.

The present species is characterized by (1) the sterile, small-sized (5-8 mm) plants, (2) the stem 6 cells thick (3) the stem-cells thin-walled, trigones absent, (4) the loosely imbricate to slightly remote, fragile and frequently caducous, ovate to narrowly ovate leaf-lobes with obtuse apices, (5) the uniformly thin cell-walls of leaf-lobes, (6) the remote, ovate (when flat subquadrate) leaf-lobules with widely and strongly inflated carinal regions and strongly arched keels, (7) the leaf-lobules covering 1/5 of the stem-width, and (8) the subacute sinuses.

The present species is closely related to *Radula tenuis* Yamada, a species known from Cuba. But the latter is different from *R. shaeferverwimpii* in that

(1) the persistent leaf-lobes, (2) the thin cell-walls of leaf-lobes with minute trigones, (3) the subquadrate to subrhombic leaf-lobules, and (4) the bases of leaf-lobules covering about 1/10 of the stem-width.

The present species belongs to sect. *Caducae* Schust. ex Yamada et Phippo.

I wish to express my sincere thanks to Mr. Alfrons Schäfer-Verwimp, and Dr. G. A. M. Scott of Queen's college, University of Melborne, for the loan of *Radula* specimens. Thanks are also due to Dr. S. Hattori of the Hattori Botanical Laboratory and Dr. H. Inoue of National Science Museum, Tokyo, for their kind critical advice.

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最近、オーストラリア(クインズランド)とブラジルで採集されたケビラゴケ属(苔類)の標本を研究する機会を持ったが、2種の新種を見いだしたので記載を行った。オーストラリア産の *Radula squarrosa* は、*R. iwatsukii* に近縁の種であるが、後者は常に葉(上片)が squarrose しないこと、細胞のトリゴンが著しく厚膜状に肥厚する点で容易に識別することができる。*Radula squarrosa* には、amentulose branches がみられるため Sect. *Amentulosae* に所属させた。ブラジル産の *Radula schaefer-verwimpii* はキューバから記載された *R. tenuis* に近い種であるが、後者は葉(上片)がキール付近から裂けて脱落しないこと、細胞壁が薄くトリゴンが小さいこと、葉下片の基部が茎の約1/10ほどしかおおわないので識別できる。本種には葉(上片)が茎から脱落する生理的性質が顕著に見られるので、Sect. *Caducae* へ配置した。

□Rix, M. & W. T. Stearn (text) : **Redouté's fairest flowers** 312 pp., 114 pls. The Herbert Press, London. £19.95. 本書は Redouté が1827-33年に出版した *Choix des plus belles fleurs* の図版を複製し、それに Rix と Stearn が書いた解説を加えたものである。巻頭に Stearn による12ページわたる Redouté についての解説がある。Redouté の名はわが国でも有名で、伝記も出版されているが、Stearn によるそれはこれまで日本で紹介されていないことにもかなり言及されていて植物学史的には重要である。図版は再同定されているが、これはたいへんな作業であったと思われる。日本でも Redouté の図譜はいくつか複刻されているが、それらに較べれば本書は安価であり、印刷の仕上りにも遜色がない。

(大場秀章)